

REMARKS

The foregoing amendment has amended claims 1-7, 13, 18 and 20-27. Now in the application are claims 1-27 of which claims 1, 13, 18 and 20 are independent. The following remarks address all stated grounds for rejection, and Applicant respectfully submits that the presently pending claims, as identified above, are in condition for allowance.

Claim Amendments

Applicant has amended claims 1, 13, 18 and 20 to clarify the scope of the claimed invention. In particular, claims 1, 13, 18 and 20 have been amended to recite an intermediate table. Claims 1, 13, 18 and 20 have also been amended to recite that the same input color data in different pixels is stored once in the intermediate table to avoid repeated conversion calculations for the different pixels having the same input image data. Support for the claim amendment can be found in Figs. 2 and 3A-3F and descriptions in the specification of the pending application, for example at page 2, line 23 through page 3, line 2. No new matter is introduced.

Rejection of Claims 1-3, 8-9, 12-14 and 17-23 Under 35 U.S.C. § 102

Claims 1-3, 8-9, 12-14 and 17-23 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,502,458 ("Braudaway"). Applicant respectfully traverses the rejection for the following reasons.

Independent claim 1 is directed to a method in which an intermediate table is built for storing the input color data for a group of pixels in an input color space. The input color data is stored at an indexed position that is responsive to the input color data. The input color data in the intermediate table is converted to an output color data in an output color space. *The same input color data in different pixels is stored once in the intermediate table to avoid repeated conversion calculations for the different pixels having the same input color data.* For each pixel in the group of pixels, the output color data is substituted for the input color data. Independent claim 13, 18 and 20 also recite the intermediate table.

In an embodiment of the claimed invention described with reference to Figs. 2 and 3A-3F in the pending application, a hash function is applied to the color data of pixels to determine indices of the pixels. A temporary palette (the intermediate table) is subsequently built by including the color data in the temporary palette at the positions of the indices. Since the indices are responsive to the color data of the pixels, the temporary palette contains only different color data. That is, the same color data in different pixels is included once in the temporary palette. As a result the conversion of the color data of the pixels into a different color space can be performed only different color data, and hence avoid the repeated color conversion for different pixels with the same color data.

Applicant submits that Braudaway does not disclose *the intermediate table* recited in claims 1, 13, 18 and 20.

Braudaway discloses a method for displaying color image on a specific computer display. Braudaway creates a palette calibration table (35) and a device independent image (45) from a standard palette (32) and an original image (40), respectively. The palette calibration table (35) and the device independent image (45) are then transmitted to a specific computer system. The specific computer system calculates a display specific palette (55) from the palette calibration table (35) and from information about the specific display (52). The specific computer system then generates the color image for display by sending the device independent image (45) and the display specific palette (55) to the display adapter in the specific computer system.

The Examiner asserts in the Office Action that the Braudaway reference discloses the index of a pixel of the claimed invention at column 9, lines 44-50. See the Office Action, page 5, lines 22-25. Applicant respectfully disagrees.

The portion of the Braudaway reference cited by the Examiner discloses the steps for preparing the display-independent image (45) in the standard computer system (10). Braudaway discloses identifying the best palette entry for the pixel by using standard halftoning techniques, and the display-independent normalized palette table (36). Braudaway also discloses storing the palette entry in the corresponding pixel location. Braudaway, however, does not disclose determining indices of pixels based on the color data of the pixels, and storing color data in the

intermediate table at the positions of the indices, as recited in the claimed invention. In Braudaway, the identified palette entry for a pixel is stored in the corresponding pixel location.

The Examiner also asserts in the Office Action that the Braudaway reference discloses the intermediate table of the claimed invention at column 5, lines 3-11 and 20-27. See the Office Action, lines 25-27. Applicant respectfully disagrees.

The portion of the Braudaway reference cited by the Examiner describes the prerequisites for the standard display (30). Braudaway discloses selecting a standard display and determining the transformation matrix M^* (34) that converts colors expressed in CIE XYZ values to RGB values. Braudaway also discloses a palette for the standard display in which each entry is ordinarily specified in terms of its digital driving signals which are required in order to produce the color of the palette entry. The standard palette (32) in Braudaway is used to create the palette calibration table (35) and the device independent image (45) from the original image (40). Braudaway, however, does not disclose that the color data of the pixels is stored in the standard palette (32) at an indexed position that is responsive to the color data of the pixels, as recited in the claimed invention. The standard palette of the Braudaway reference does not correspond to the intermediate table recited in claims 1, 13, 18 and 20.

In comparison, the claimed invention creates a mapping from the color data of input pixels to indices (positions) of the pixels. The intermediate table contains color data of input pixels at the positions of the indices. By converting the color data in the intermediate table to the output color data in the second color space, and reconstructing the output pixels using the output color data, the claimed invention enhances the conversion efficiencies. That is, the claimed invention determines the indices based on the color data of the input pixels and storing the color data in the intermediate table at the positions of the indices. Consequently, the intermediate table includes a single entry for multiple input pixels that have the same color data. The claimed invention then performs a single conversion operation for the different pixels with the same color data, and hence avoids the repeated conversion calculations for different pixels having the same color data. In this manner, the claimed invention reduces the number of conversion calculations, and accelerates the color conversion process of input color data.

The Braudaway reference does not disclose this feature of the claimed invention. In Braudaway, every pixel in the original image must be individually processed and converted on a pixel by pixel basis. Braudaway does not disclose avoiding the repeated conversion calculations for different pixels of the original image having the same color data.

Additionally, Applicant submits that Braudaway does not disclose that the indexed position of the pixels is stored in an index array at a location in the index array that corresponds to a location in the group of pixels, as recited in claim 22. The Examiner asserts that Braudaway discloses this feature of the claimed invention at column 5, lines 45-53. Applicant respectfully disagrees.

Braudaway discloses that an image has its pixel colors defined by CIE XYZ tristimulus values. Braudaway also discloses that the display-independent matrix of transformation M^* , in place of the display-specific matrix M , is used to convert the XYZ's of each pixel to the display independent RGB tristimulus values. Braudaway does not disclose that the indexed position of the pixels is stored in an index array, as recited in the claimed invention, because the independent RGB tristimulus values disclosed in Braudaway do not correspond to the indexed position of the pixels. The independent RGB tristimulus values are not used as the indexed position for storing the color data of the pixels in the intermediate table.

In light of the foregoing claim amendments and arguments, Applicant submits that Braudaway does not disclose each and every element of claims 1, 13, 18 and 20. Applicant therefore requests the Examiner to reconsider and withdraw the rejection of claims 1-3, 8-9, 12-14 and 17-23 under 35 U.S.C. §102(b), pass the claims to allowance.

Rejection of Claims 4-5, 10-11, 16 and 24-25 Under 35 U.S.C. § 103

Claims 4-5, 10-11, 16 and 24-25 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,502,458 ("Braudaway") in view of U.S. Patent No. 5,579,031 ("Liang"). Applicant respectfully traverses the rejection for the following reasons.

Claim 4-5, 10-11, 16 and 24-25 depend on one of independent claims 1, 13 and 20. Liang is cited by the Examiner to provide teachings for the limitations added in claim 4-5, 10-11, 16 and 24-25. Applicant submits that the combination of Braudaway and Liang does not teach *the intermediate table* recited in claims 1, 13 and 20.

Liang teaches a process for producing two matched color displays of a digital image using two different display devices. Liang uses an adaptor to convert the digital information representing the image to digital information such that the displayed image as a result of this converted digital information on one of the devices, appears the same as the image displayed on the other. Liang, however, does not teach the intermediate recited in claims 1, 13 and 20.

In light of this, Applicant submits that Braudaway and Liang, in combination, do not teach or suggest all of the limitations of independent claims 1, 13 and 20. Claim 4-5, 10-11, 16 and 24-25, which depend on one of independent claims 1, 13 and 20, are not rendered obvious over the cited prior art references. Applicant therefore requests the Examiner to reconsider and withdraw the rejection of claims 4-5, 10-11, 16 and 24-25 under 35 U.S.C. §103(a), and pass the claims to allowance.

Rejection of Claims 6-7, 15 and 26-27 Under 35 U.S.C. § 103

Claims 6-7, 15 and 26-27 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,502,458 (“Braudaway”) in view of U.S. Patent No. 5,668,890 (“Winkelman”). Applicant respectfully traverses the rejection for the following reasons.

Claim 6-7, 15 and 26-27 depend on one of independent claims 1, 13 and 20. Winkelman is cited by the Examiner to provide teachings for the limitations added in claim 6-7, 15 and 26-27. Applicant submits that the combination of Braudaway and Winkelman does not teach *the intermediate table* recited in claims 1, 13 and 20.

Winkelman teaches a method for analyzing an image. Winkelman teaches the image values of a first color space allocated to the input apparatus are transformed into image values of a second color space that is independent of the first color space. Winkelman teaches that the

analysis of the image is implemented on the basis of the transformed image values of the second color space. Winkelman, however, does not teach the intermediate table recited in claims 1, 13 and 20.


In light of this, Applicant submits that Braudaway and Winkelman, in combination, do not teach or suggest all of the limitations of independent claims 1, 13 and 20. Claims 6-7, 15 and 26-27, which depend on one of independent claims 1, 13 and 20, are not rendered obvious over the cited prior art references. Applicant therefore requests the Examiner to reconsider and withdraw the rejection of claims 6-7, 15 and 26-27 under 35 U.S.C. §103(a), and pass the claims to allowance.

Conclusion

In view of the remarks set forth above, Applicant contends that claims 1-27 are presently pending in this application, are patentable and in condition for allowance. If the Examiner deems there are any remaining issues, we invite the Examiner to call the undersigned at (617) 227-7400.

Dated: September 1, 2006

Respectfully submitted,

By 
EuiHoon Lee

Registration No.: L0248
LAHIVE & COCKFIELD, LLP
28 State Street
Boston, Massachusetts 02109
(617) 227-7400
(617) 742-4214 (Fax)
Attorney/Agent For Applicant